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April 1st, 2010
Renesas Electronics Corporation

Issued by: Renesas Electronics Corporation (<http://www.renesas.com>)

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Not recommended
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CR04AM-12

Thyristor

Low Power Use

REJ03G0354-0200

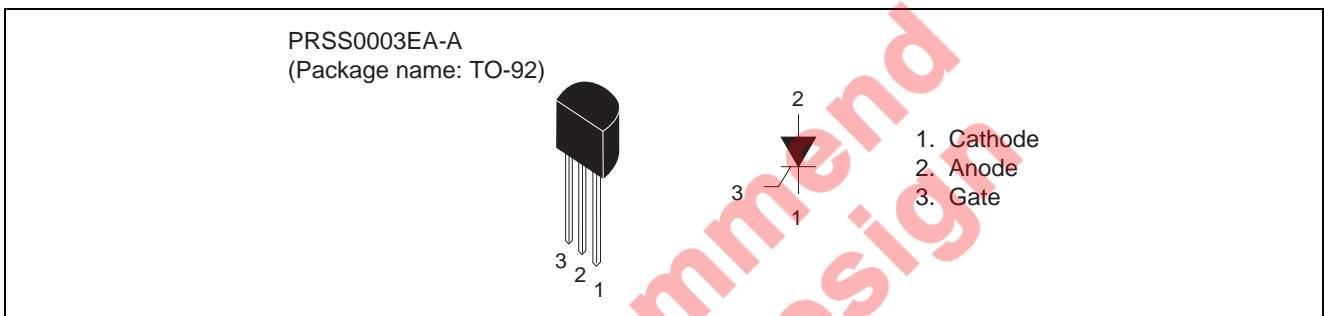
Rev.2.00

Mar.01.2005

Features

- $I_{T(AV)}$: 0.4 A
- V_{DRM} : 600 V
- I_{GT} : 100 μ A
- Glass Passivation Type

Outline



Applications

Igniter, solid state relay, strobe flasher, circuit breaker, and other general purpose control applications

Maximum Ratings

Parameter	Symbol	Voltage class	Unit
		12	
Repetitive peak reverse voltage	V_{RRM}	600	V
Non-repetitive peak reverse voltage	V_{RSM}	720	V
DC reverse voltage	$V_{R(DC)}$	480	V
Repetitive peak off-state voltage ^{Note1}	V_{DRM}	600	V
DC off-state voltage ^{Note1}	$V_{D(DC)}$	480	V

Parameter	Symbol	Ratings	Unit	Conditions
RMS on-state current	$I_{T(RMS)}$	0.63	A	
Average on-state current	$I_{T(AV)}$	0.4	A	Commercial frequency, sine half wave 180° conduction, $T_a = 54^\circ\text{C}$
Surge on-state current	I_{TSM}	10	A	60Hz sine half wave 1 full cycle, peak value, non-repetitive
I^2t for fusing	I^2t	0.4	A^2s	Value corresponding to 1 cycle of half wave 60Hz, surge on-state current
Peak gate power dissipation	P_{GM}	0.5	W	
Average gate power dissipation	$P_{G(AV)}$	0.1	W	
Peak gate forward voltage	V_{FGM}	6	V	
Peak gate reverse voltage	V_{RGM}	6	V	
Peak gate forward current	I_{FGM}	0.3	A	
Junction temperature	T_j	-40 to +125	$^\circ\text{C}$	
Storage temperature	T_{stg}	-40 to +125	$^\circ\text{C}$	
Mass	—	0.23	g	Typical value

Notes: 1. With gate to cathode resistance $R_{GK} = 1\text{ k}\Omega$.

Electrical Characteristics

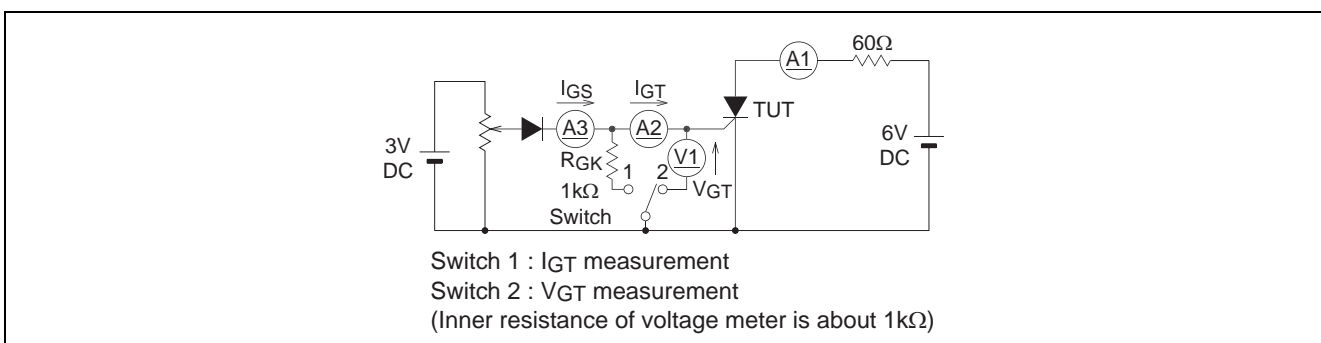
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test conditions
Repetitive peak reverse current	I_{RRM}	—	—	0.5	mA	$T_j = 125^\circ\text{C}$, V_{RRM} applied
Repetitive peak off-state current	I_{DRM}	—	—	0.5	mA	$T_j = 125^\circ\text{C}$, V_{DRM} applied, $R_{GK} = 1\text{ k}\Omega$
On-state voltage	V_{TM}	—	—	1.2	V	$T_a = 25^\circ\text{C}$, $I_{TM} = 1.2\text{ A}$, instantaneous value
Gate trigger voltage	V_{GT}	—	—	0.8	V	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $I_T = 0.1\text{ A}$ ^{Note3}
Gate non-trigger voltage	V_{GD}	0.2	—	—	V	$T_j = 125^\circ\text{C}$, $V_D = 1/2 V_{DRM}$, $R_{GK} = 1\text{ k}\Omega$
Gate trigger current	I_{GT}	1	—	100 ^{Note2}	μA	$T_j = 25^\circ\text{C}$, $V_D = 6\text{ V}$, $I_T = 0.1\text{ A}$ ^{Note3}
Holding current	I_H	—	1.5	3	mA	$T_j = 25^\circ\text{C}$, $V_D = 12\text{ V}$, $R_{GK} = 1\text{ k}\Omega$
Thermal resistance	$R_{th(j-a)}$	—	—	150	$^\circ\text{C/W}$	Junction to ambient

Notes: 2. If special values of I_{GT} are required, choose item D or E from those listed in the table below if possible.

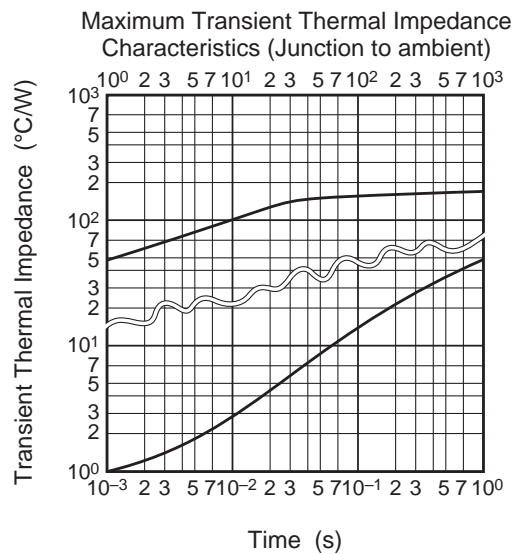
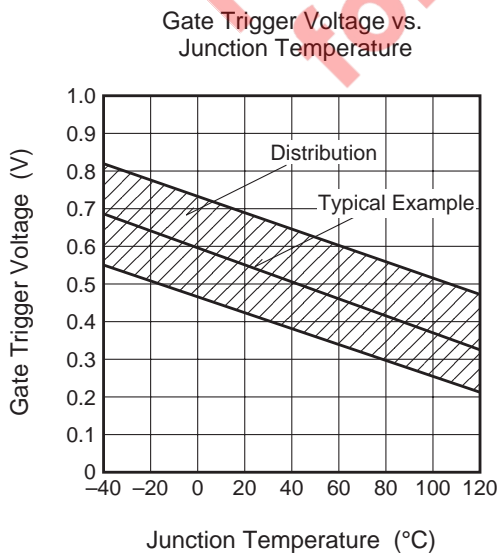
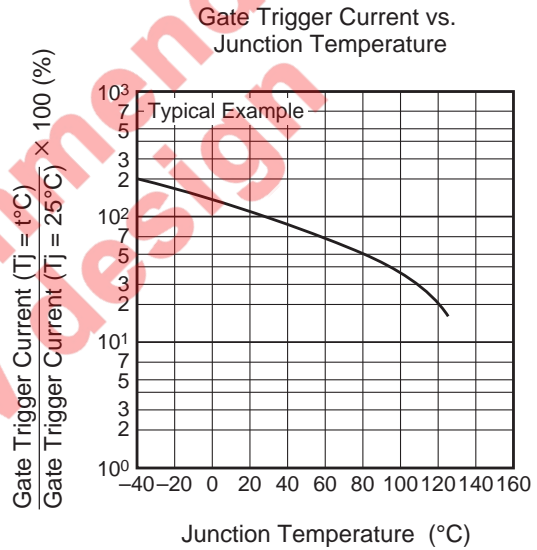
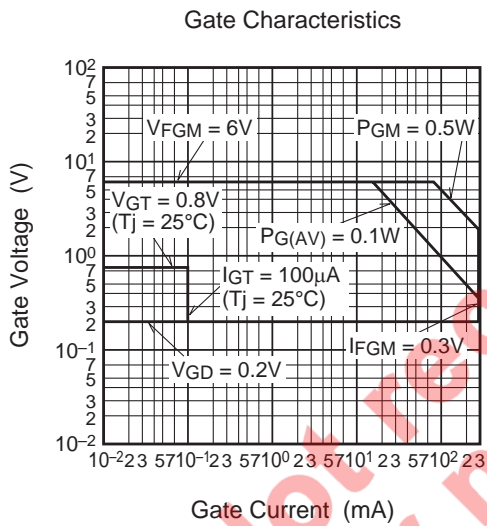
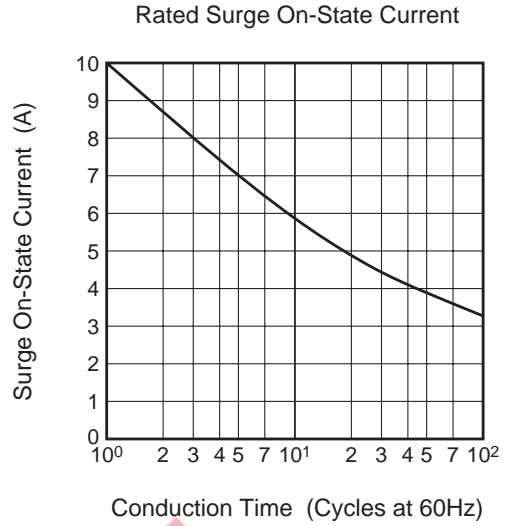
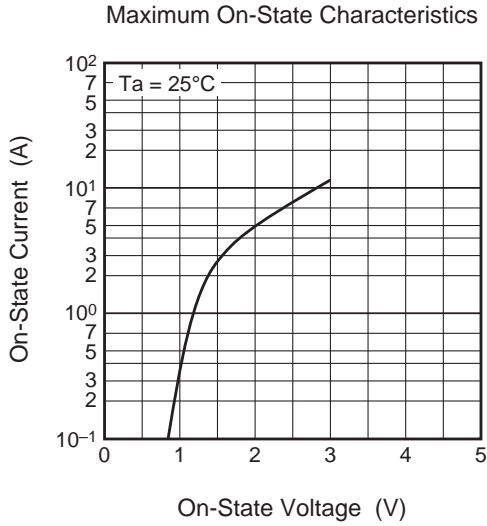
Item	A	B	C	D	E
$I_{GT} (\mu\text{A})$	1 to 30	20 to 50	40 to 100	1 to 50	20 to 100

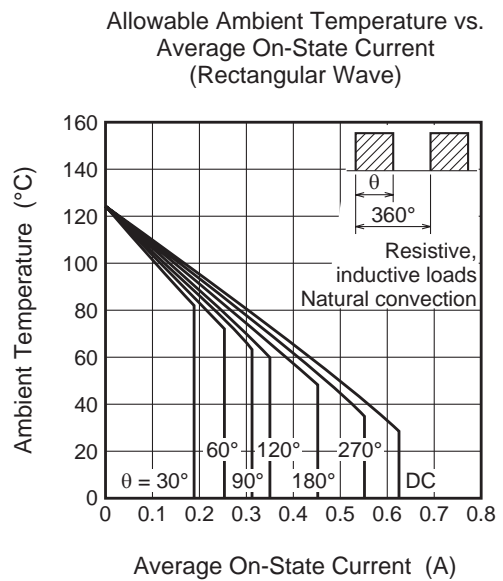
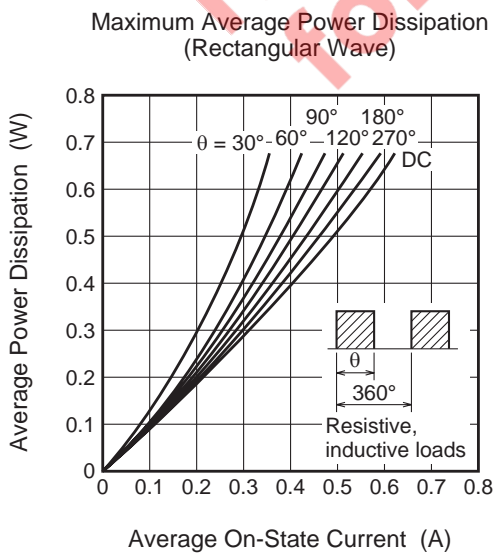
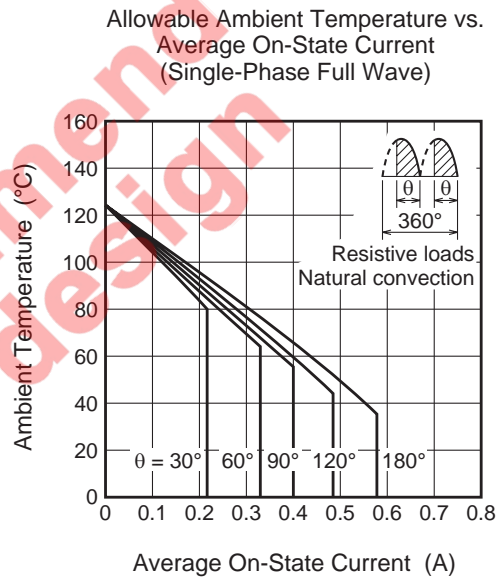
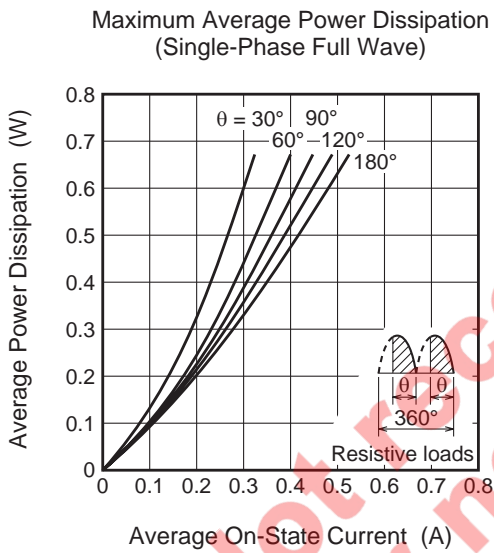
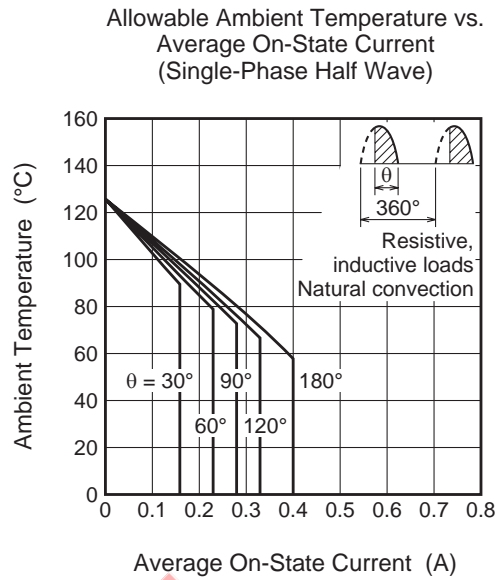
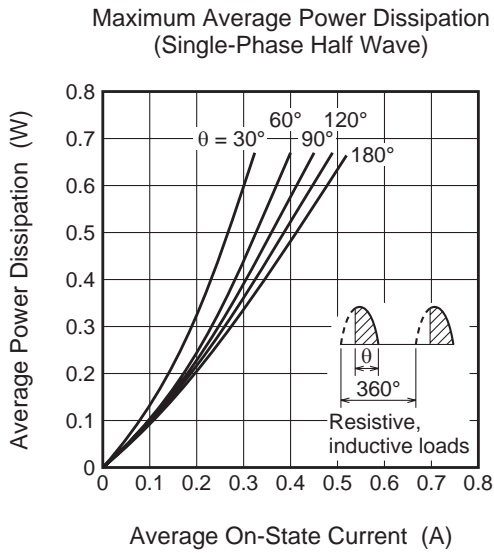
The above values do not include the current flowing through the $1\text{ k}\Omega$ resistance between the gate and cathode.

3. I_{GT} , V_{GT} measurement circuit.

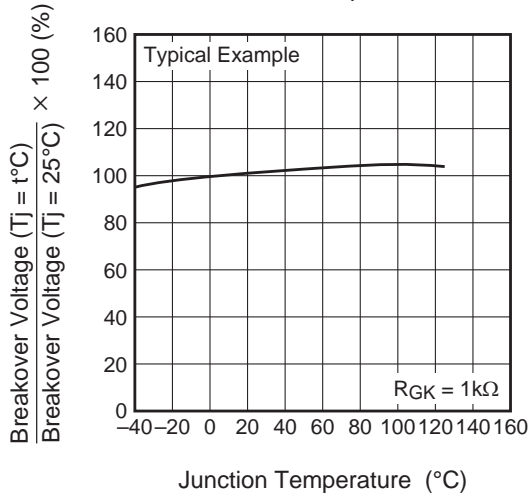


Performance Curves

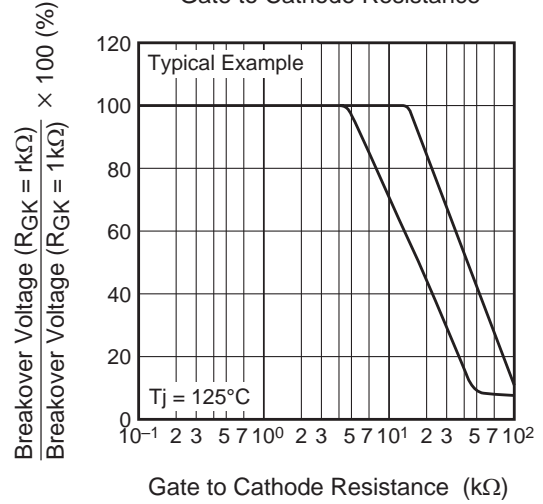




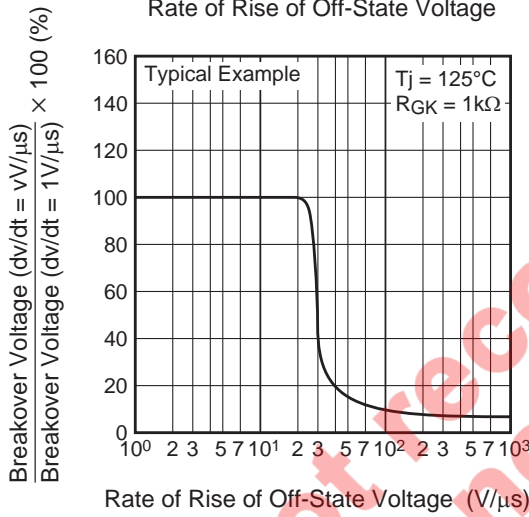
Breakover Voltage vs. Junction Temperature



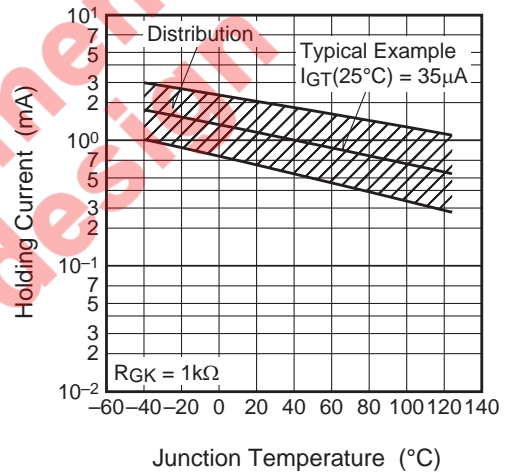
Breakover Voltage vs. Gate to Cathode Resistance



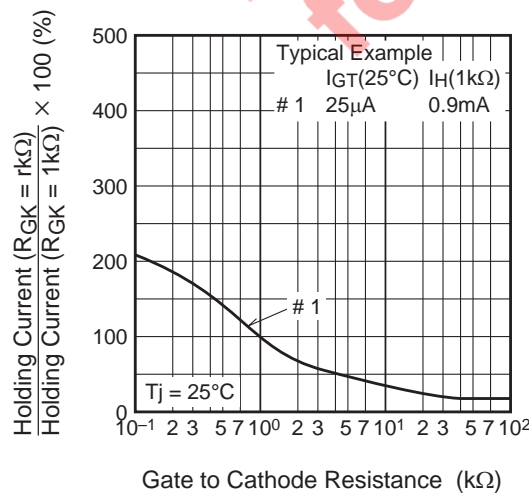
Breakover Voltage vs. Rate of Rise of Off-State Voltage



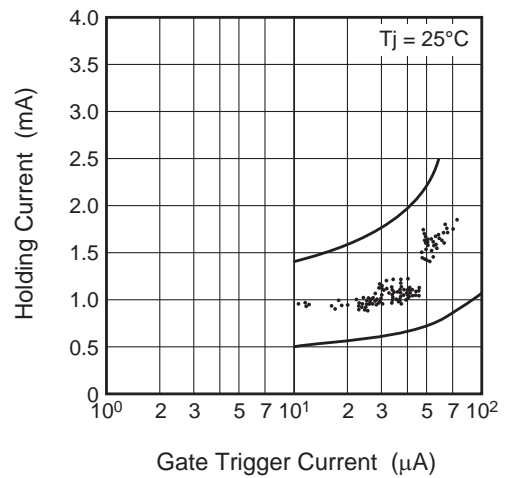
Holding Current vs. Junction Temperature



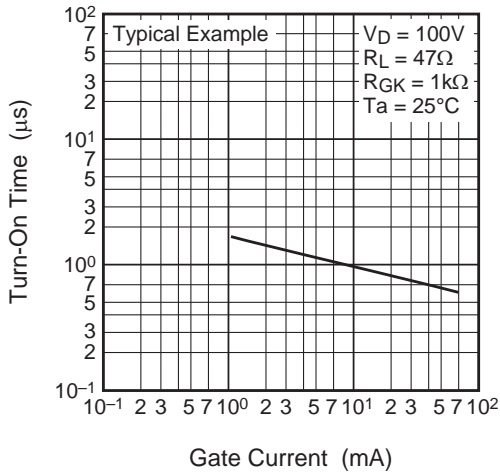
Holding Current vs. Gate to Cathode Resistance



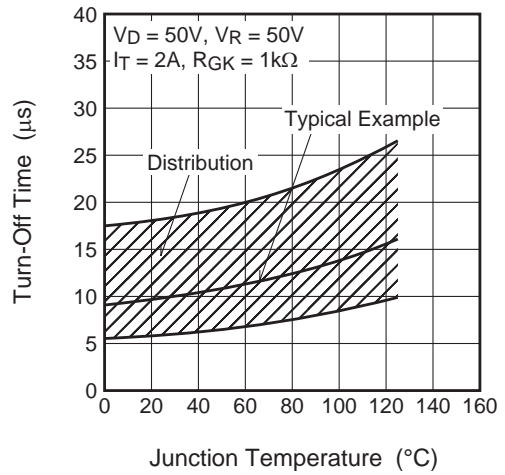
Holding Current vs. Gate Trigger Current



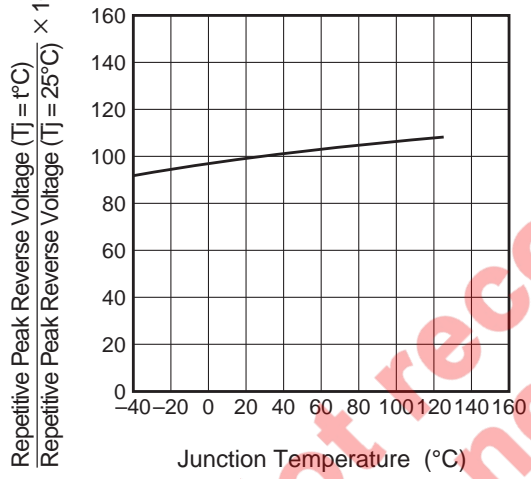
Turn-On Time vs. Gate Current



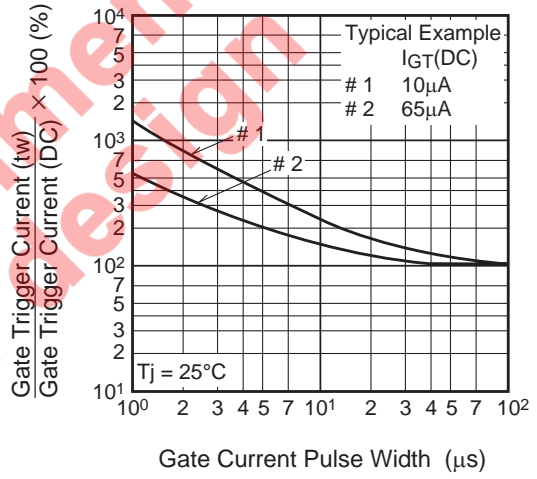
Turn-Off Time vs. Junction Temperature



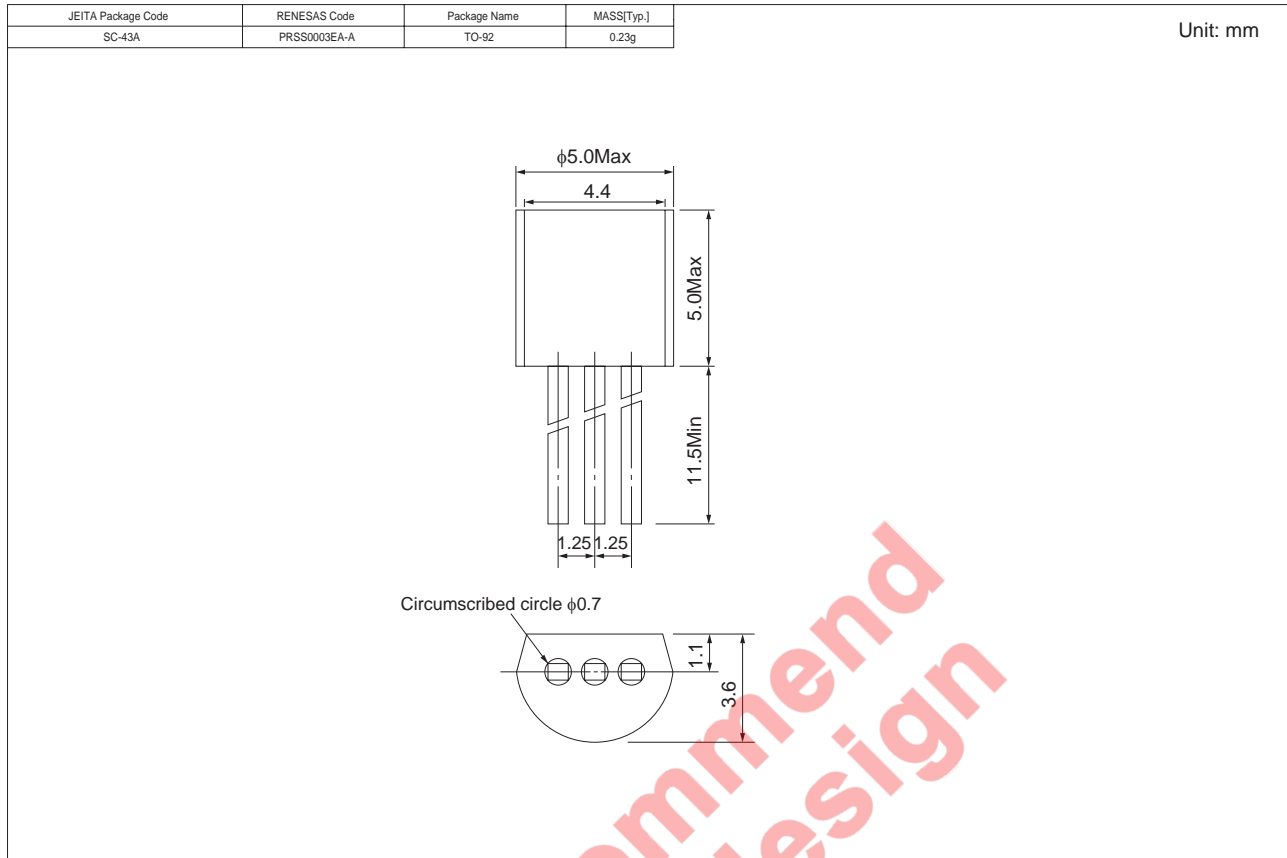
Repetitive Peak Reverse Voltage vs. Junction Temperature



Gate Trigger Current vs. Gate Current Pulse Width



Package Dimensions



Order Code

Lead form	Standard packing	Quantity	Standard order code	Standard order code example
Straight type	Vinyl sack	500	Type name	CR04AM-12
Lead form	Vinyl sack	500	Type name – Lead forming code	CR04AM-12-A6
Form A8	Taping	2000	Type name – TB	CR04AM-12-TB

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Renesas Technology Europe Limited
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Unit2607 Ruijing Building, No.205 Maoming Road (S), Shanghai 200020, China
Tel: <86> (21) 6472-1001, Fax: <86> (21) 6415-2952

Renesas Technology Singapore Pte. Ltd.
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